



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/927,041	08/09/2001	Alexander C. Loui	82600DMW	4725

7590

05/20/2004

Thomas H. Close  
Patent Legal Staff  
Eastman Kodak Company  
343 State Street  
Rochester, NY 14650-2201

EXAMINER

HANNE, SARA M

ART UNIT PAPER NUMBER

2173

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/927,041

Applicant(s)

LOUI ET AL.

Examiner

Sara M Hanne

Art Unit

2173

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6.7.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

BA HUYNH  
PRIMARY EXAMINER

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 10, 17 and 20 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

The claims are written in the form of a preamble made to depend on another claim. The stated preamble is not given patentable weight as it fails to breathe life, meaning, and vitality into the claims. As such, the claims fail to further limit the subject matter of the claim(s) upon which they depend. See MPEP §§ 608.01(n) and 2111.02.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3. Claims 1-2, 4-7 are rejected under 35 U.S.C. 102(a) as being anticipated by Qian et al., US Patent 6721454.

As in Claims 1 and 10, Qian et al. teaches a method and computer storage medium with instructions for obtaining unstructured video frames ("A video sequence 2 is input", Column 2, lines 64-65), generating segments from the shot boundaries based

on the color dissimilarity between consecutive frames ("A color histogram technique may be used to detect the boundaries of the shots", Column 3, lines 42-43), extracting a set by processing pairs of segments ("the global motion of the video content is estimated 8 for each pair of frames in a shot", Column 3, lines 59-61) for their visual dissimilarity and temporal relationship, and merging the video segments by applying a probabilistic analysis to the extracted set to represent the video structure ("each shot is summarized 16 ... events 22 are inferred from the shot summaries by a domain specific event inference model". Column 3, lines 6-8).

As in Claim 2, Qian et al. teaches generating color histograms from the consecutive frames and from the histograms, generating a difference signal, thresholding of this signal based on a mean dissimilarity over several frames to produce a signal representative of the existence of a shot boundary (Column 3, lines 42-50 and Figure 5).

As in Claim 4, Qian et al. teaches morphologically transforming the thresholded difference signal with a pair of structuring elements to eliminate the presence of multiple adjacent shot boundaries ("When the difference between the histograms of two frames exceeds a predefined threshold, the content of the two frames is assumed to be sufficiently different", Column 3, lines 45-48).

As in Claim 5, Qian et al. teaches computing a mean color histogram for each segment and a visual dissimilarity feature metric from the difference between mean color histograms for pairs of segments (Column 3, lines 42-50 and Figure 5).

As in Claim 6, Qian et al. teaches processing pairs of segments for a temporal separation between pairs of segments and for an accumulated temporal duration between pairs of segments ("each shot is summarized 16 ... events 22 are inferred from the shot summaries by a domain specific event inference model". Column 3, lines 6-8).

As in Claim 7, Qian et al. teaches generating parametric mixture models (summaries created by shot summarization 16, Figure 1) to represent class-conditional densities of the inter-segment features (based on temporal information and color analysis, See Claim 1 rejection *supra*) that comprise the feature set and applying the merging criterion to the parametric mixture models (event inference 20/detected events 22, Figure 1).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al., US Patent 6721454.

Qian et al. teaches obtaining unstructured video frames, generating segments from the shot boundaries based on the color dissimilarity between consecutive frames, extracting a set by processing pairs of segments for their visual dissimilarity and temporal relationship by generating color histograms from the consecutive frames and

from the histograms, generating a difference signal, thresholding of this signal based on a mean dissimilarity over several frames to produce a signal representative of the existence of a shot boundary (See Claim 2 rejection *supra*) and merging the video segments by applying a probabilistic analysis to the extracted set to represent the video structure (See Claim 1 rejection *supra*) and the difference signal to be based on a mean dissimilarity over several frames centered on one frame. Qian et al. fails to teach basing the number of frames used to calculate the difference signal on a fraction of the frame rate of video capture as recited in the claims. Within the field of the invention, it would be obvious to one of ordinary skill in the art to base the number of frames on a fraction of the frame rate (See also Image Analysis and Mathematic Morphology, Vol. 1, Jean Serra). One would have been motivated to make such a combination because a shortened time frame for calculating the difference signal would have been obtained.

6. Claim 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al., US Patent 6721454.

In accordance with Claims 8 and 15, it is notoriously well known that queues are used to implement hierarchical displays. The examiner takes official notice of this teaching. It would be obvious to one of ordinary skill in the art to combine the use of the organizing video segments into hierarchies with a queue implementation.

7. Claims 9, 11-15 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian et al., US Patent 6721454 and further in view of Qian et al., US Patent 6616529.

As in Claims 9, 11, 17-18 and 20, US Patent 6721454 teaches a method and computer storage medium with instructions for obtaining unstructured video frames ("A video sequence 2 is input", Column 2, lines 64-65), generating segments from the shot boundaries based on the color dissimilarity between consecutive frames ("A color histogram technique may be used to detect the boundaries of the shots", Column 3, lines 42-43), extracting a set by processing pairs of segments ("the global motion of the video content is estimated 8 for each pair of frames in a shot", Column 3, lines 59-61) for their visual dissimilarity and temporal relationship, merging adjacent video segments by applying a probabilistic analysis to the extracted set to represent the video structure ("each shot is summarized 16 ... events 22 are inferred from the shot summaries by a domain specific event inference model". Column 3, lines 6-8), and generating a parametric mixture model of the inter-segment features ("In this model inference module, a hunt event is inferred after detecting three shots containing hunt candidates", Column 11, lines 60-62). While US Patent 6721454 teaches the segmentation due to color dissimilarity, extraction due to visual dissimilarity and temporal relationships, merging with probabilistic analysis and generation of a parametric mixture model, they fail to show the probabilistic analysis to be a Bayesian analysis applied to the parametric mixture model, and representing the merging sequence in a hierarchical tree structure as recited in the claims. US Patent 6616529 teaches a video segmentation

method similar to that of US Patent 6721454. In addition, US Patent 6616529 further teaches the probabilistic analysis to be a Bayesian analysis applied to the parametric mixture model (Figure 3 and corresponding text in Columns 4-5), and representing the merging sequence in a hierarchical tree structure (Figures 2a-2g and corresponding text). It would have been obvious to one of ordinary skill in the art, having the teachings of US Patent 6721454 and US Patent 6616529 before him at the time the invention was made, to modify the segmentation with color dissimilarity and temporal relationships with a parametric mixture model taught by US Patent 6721454 to include the construction of hierarchy according to probabilistic merging with Bayesian analysis of US Patent 6616529, in order to obtain a hierarchical representation of the frames grouped by color dissimilarity and temporal relationships according to Bayesian probability methods of analysis. One would have been motivated to make such a combination because a visual representation of the segmented video would have been obtained, as taught by US Patent 6616529 (Column 2, lines 24-55).

As in Claim 12, US Patent 6721454 teaches computing a mean color histogram for each segment and a visual dissimilarity feature metric from the difference between mean color histograms for pairs of segments (See Claim 5 rejection *supra*).

As in Claim 13, US Patent 6721454 teaches processing pairs of segments for a temporal separation between pairs of segments and for an accumulated temporal duration between pairs of segments (See Claim 6 rejection *supra*).



As in Claim 14, US Patent 6721454 teaches generating parametric mixture models to represent class-conditional densities of the inter-segment features that comprise the feature set (See Claim 7 rejection *supra*).

As in Claim 15, US Patent 6721454 teaches performing the merging in a hierarchical queue by initializing the queue by introducing each feature in the queue with a priority of the probability of merging each corresponding pair of segments, depleting the queue by merging the segments if the criterion is met, and updating the queue based on the updated model (See Claim 8 rejection *supra*).

As in Claim 16, US Patent 6721454 teaches representing the merging sequence as a hierarchical tree structure (See Claim 9 rejection *supra*) including a frame extracted from each segment and displayed at each node of the tree (Column 10, line 61 – Column 11, line 6).

As in Claim 19, US Patent 6721454 teaches representing the merging sequence as a hierarchical tree structure including a frame extracted from each segment and displayed at each node of the tree (See Claim 16 rejection *supra*).

**Conclusion**

The prior art made of record on form PTO-892 and not relied upon is considered pertinent to applicant's disclosure. Applicant is required under 37 C.F.R. § 1.111(c) to consider these references fully when responding to this action. The documents cited therein teach... [state relationship between the cited patents and the claims, e.g., ...similar virtual reality simulators for robot kinematic devices and back propagation delays in neural networks.]

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sara M Hanne whose telephone number is (703) 305-0703. The examiner can normally be reached on M-F 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Cabeca can be reached on (703) 308-3116. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

smh

  
BA HUYNH  
PRIMARY EXAMINER